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Ames Research Center
Moffett Field, CA

Space Science Division

Responsible NASA
Official
Donald DeVincenzi

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Selected Research

Personnel

Publications

Organization Chart

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- AUGUSTUS SELLER
ALFRED
ANDREW
ARTHUR
BENJAMIN
CHARLES
DAVID
EDWARD
FRANK
GEORGE
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LEWIS
MARTIN
MICHAEL
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PETER
RICHARD
SAMUEL
THOMAS
WILLIAM

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Space Science Seminars and
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Annual Report

The Division of NASA Ames Research Center is dedicated to research in astrophysics, microbiology, advanced life support technology, and planetary science. These research programs are structured around astrobiology (the study of life in the universe), the chemical and physical forces and processes that influence life's origin, evolution (if any), and address some of the most fundamental questions pursued by science.

These questions examine the origin of life and place in the universe. Ames is recognized as a world leader in Astrophysics. In our Mission in Astrophysics, Space Sciences Division scientists are conducting research in astrophysics and technology development.

Branches

Astrophysics

Planetary systems

Exobiology


Astrobiology/technology

Related Links

Office of Space Science
Aerospace Research Center
Code Directorate
NASA Astrobiology Institute
NASA Center for
Computational Astrobiology
Center For Mars Exploration
SETI Institute

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The Space Science Division at NASA Ames Research Center is dedicated to research in astrophysics, exobiology, advanced life support technologies, and planetary science. These research programs are structured around Astrobiology (the study of life in the universe and the chemical and physical forces and adaptations that influence life's origin, evolution, and destiny), and address some of the most fundamental questions pursued by science.

These questions examine the origin of life and our place in the universe. Ames is recognized as a world leader in Astrobiology. In pursuing our mission in Astrobiology, Space Science Division scientists perform pioneering basic research and technology development.

For more information about the Space Science Division, [download our Annual Report](#).

Branches


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Astrobiology Technology Branch (SSR) Overview

The Astrobiology Technology Branch supports fundamental research and the development of advanced technologies in astrobiology as they relate to the exploration of space and understanding life in the universe. Current branch efforts encompass research and technology development for advanced life support, utilization of planetary resources, and astrobiology. Advanced Life Support focused research is directed primarily at physicochemical processes for use in regenerative life support systems required for future human missions and includes atmosphere revitalization, water recovery, waste processing/resource recovery, and systems modelling, analysis and controls associated with integrated subsystems operation. In-Situ Resource Utilization (ISRU) technologies will become increasingly important on every Mars lander between 2003 and a human mission to Mars. The branch focus is on the development of technologies for Mars atmosphere acquisition, buffer gas production, and CO2 compression. Research and technology development for astrobiology includes understanding the physical and chemical limits to which life has adapted on Earth, the molecular adaptations that have allowed living systems to inhabit extreme environments, and the application of this knowledge to biotechnology, nanotechnology, and planetary protection. Researchers in the branch also develop flight experiments and associated hardware for shuttle, ISS, and unmanned NASA missions.

Mark Kliss
Chief, Astrobiology Technology Branch (SSR)

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Exobiology Branch (SSX) Overview

The Branch's research focuses on the advancement of the scientific understanding of the origin and distribution of life by conducting research on the cosmic history of biogenic compounds, prebiotic evolution, and the early evolution of life. This is accomplished via laboratory experiments, theoretical studies/computational modeling, and field investigations. Branch personnel are also involved in the development of flight instruments, experiments, and small mission definition with particular emphasis being placed on studies of Mars and the development of instrumentation for martian flight missions. Several Branch scientists are part of a task module that is a component of the Ames membership in the Astrobiology Institute. Branch scientists provide expertise in exobiology, astrobiology, planetary protection, and other areas of planetary science to NASA Headquarters and external review and advisory panels, and some serve as editors and associate editors of scientific journals.

Exobiology studies includes the history, distribution, and chemistry of biogenic elements in the solar system; prebiotic chemical evolution and the origin of life; and the history of Earth's early biosphere as recorded in microorganisms and ancient rocks. The research is conducted both on Earth and in space. The Branch also serves as the center of expertise within the agency for issues of planetary protection. As the agency lead center in exobiology, Branch exobiologists exercise a leadership role in NASA's Exobiology Program through program planning, performance reviews, advisory services to related NASA programs, and external relations.

David Blake
Chief, Exobiology Branch (SSX)

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Planetary Systems Branch (SST) Overview

The overall research effort in the Planetary Systems Branch is directed at acquiring new, fundamental knowledge about the origins of stars and planetary systems and life itself. These studies are an integral part of NASA's overarching thrust in Astrobiology. Principal research programs include studies of the formation of stars and planets and the early history of the solar system, studies of planetary atmospheres and climate, investigation of the dynamics of planetary disks and rings, work on problems associated with the Martian surface including resource utilization and environments for the origin of life, and other programs (chiefly theoretical) involving stellar and planetary dynamics, radiative processes in stars and the interstellar medium, and investigation of the physical and chemical conditions in molecular clouds and star formation regions. Scientists in the branch also support NASA flight missions through participation on various mission science teams. The primary product of the Branch is new knowledge about the nature of the universe, presented and published in the open literature.

Bruce Smith
Assistant Chief, Planetary Systems Branch (SST)

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Astrophysics Branch (SSA) Overview

Scientists in the Astrophysics Branch pursue a wide range of laboratory and observational astronomy research. The Branch is particularly interested in studying the physical and chemical properties of astronomical phenomena by observing their radiation at infrared (and ultraviolet) wavelengths, beyond the range of visible light.

Planets, stars, and the interstellar medium of the Milky Way and other galaxies are rich in infrared spectral features which provide clues to their origins, physics, chemistry, and evolution. SSA researchers use state-of-the-art laboratories, ground-based, airborne, and space-based observatories to conduct their research. Astrophysics Branch scientists, engineers, and technicians also play key roles in developing new NASA space and airborne missions and instruments such as SIRTf, NGST, and SOFIA. The primary products of the Astrophysics Branch are new observations of the universe and new instrumentation developed to make these observations.

Jesse Bregman

Deputy Chief, Astrophysics Branch (SSA)

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